THE USE OF WILLINGNESS-TO-PAY (WTP) METHOD TO IDENTIFY POTENTIAL FOR USE OF SOLAR ENERGY

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ABSTRACT

Solar energy is one of the renewable energy systems that are the most environmentally friendly means of providing electricity. Developing countries such as in Asia has experiencing spectacular economic growth over the past two decades. Improvement in living standards increases the demand for electronic appliances and others for living comfort. This will result in the pressure of energy demand. One of the ways to improve the energy efficiency is by the use of clean energy such as solar energy as a real solution. Presently, the common issue in developing Asian countries is subsidies for fossil fuels which have been the obstacle to the penetration of renewable energy. As for this study, Kuala Lumpur has been chosen as the study area. This study focused on the awareness of the public on the solar energy and their willingness to pay (WTP) and use through observation and survey. For this study, one hundred and twenty respondents were involved. Result shows that the level of awareness is high (83%). Result shows 26.2% WTP of RM 5,000; with a mode value of RM 4,140. A linear correlation exists between marital status and family income on how much people are willing to spend. Higher family income and single respondents tend to have higher WTP. However, overall interest on solar energy depends on income and gender. Those with higher personal income are more interested in this technology. It also shows that female have higher interest in solar energy.

ABSTRAK

Tenaga solar merupakan salah satu tenaga yang boleh diperbaharui dan sumber yang tidak menyebabkan pencemaran alam untuk menghasilkan tenaga elektrik. Negara yang sedang membangun seperti negara-negara di Asia sedang mengalami pembangunan ekonomi yang pesat. Taraf hidup yang semakin meningkat turut meningkatkan permintaan untuk peralatan elektronik dan sebagainya untuk keselesaan hidup. Ini akan menyebabkan permintaan tenaga menjadi tinggi. Salah satu cara untuk mengatasi masalah ini adalah dengan menggunakan tenaga solar sebagai penyelesiannya. Pada masa sekarang, masalah utama yang dihadapi oleh Negara-negara sedang membangun di Asia adalah subsidi untuk bahan bakar yang menjadi penghalang kepada kemasukan penggunaan tenaga boleh diperbaharui. Kuala Lumpur telah dipilih untuk menjadi kawasan kajian untuk kajian ini. Kajian member focus kepada tahap kesedaran orang awam mengenai tenaga solar dan kesanggupan untuk membayar (KUM) menggunakan kaedah kajian melalui boring soal selidik. Seramai seratus dua puluh orang responden terlibat. Keputusan kajian menunjukkan tahap kesedaran adalah tinggi (83%). 26.2% dari nilai KUM adalah RM 5,000, dengan mod RM 4,140. Terdapat regrasi linear antara status perkahwinan dan pendapatan keluarga dengan KUM. Pendapatan keluarga yang tinggi dan responden yang belum berkahwin mempunyai nilai KUM yang lebih tinggi. Minat atau kecenderungan terhadap tenaga solar pula dipengaruhi oleh pendapatan individu dan juga gender. Kajian menunjukkan mereka yang berpendapatan tinggi lebih berminat dengan tenaga solar. Kajian juga menunjukkan bahawa kaum perempuan mempunyai minat yang tinggi terhadap tenaga solar.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

Nowadays it is becoming increasingly clear that human activity is changing the global climate. Even though natural processes have contributed to global climate changes to some extent it is extremely unlikely that the scope of this changes during the last century could be solely attributed to natural factors (Ganopolski, 2005). The problem is mainly caused by the energy resources we are predominately using. Solar energy is expected to play a major role in the future of electricity production.

1.1 Statement of Problem

Electrical power is an ideal kind of energy in that it can be easily supplied to the customer and converted into other kind of energy. Traditional means of burning fuel to generate power however is accompanied by chemical and

radiation contamination that causes defect to the environment (Andreev et al., 1997). Fossil fuel provides the majority of the world's requirement.

Presently, Malaysia is well endowed with energy supply. Electricity generation is mostly fossil-based, which are natural gas and oil in particular which so far has been able to meet the country's demand for energy. Primary energy supply in 2000 was 50,658 kilotonnes of oil equivalent (ktoe) and it shows an increase to 54,194 ktoe in 2003. Final energy demand, increased from 29,996 ktoe in 2000 to 34,568 ktoe in 2003. Demand for electricity increased from 60,200 GWh in 2000 to 71,159 GWh in 2003. It is assumed that the demand for electricity in Malaysia will further grow in the future (Jafar et al., 2007).

Fossil-based source of electricity such as natural gas and oil produces CO2, SO2 and NOx as their by-products. The emission of these pollutants into the environment causes harmful effect to human health, flora and fauna and also to buildings.

The traditional means of generating electrical power also contribute to thermal pollution. Common cause of thermal pollution is power plants and industrial manufacturers that use water as coolant. Thermal pollution is the degradation of water quality by any process that changes ambient water temperature. Thermal pollution is usually associated with increases of water temperatures in a stream, lake, or ocean due to the discharge of heated water from industrial processes, such as the generation of electricity. Increases in ambient water temperature also occur in streams where shading vegetation along the banks is removed or where sediments have made the water more turbid. Both of these effects allow more energy from the sun to be absorbed by the water and thereby increase its temperature. There are also situations in which the effects of colder-than-normal water temperatures may be observed (Farret et al., 2006).

Warm water typically decreases the level of dissolved oxygen in the water. The decrease in levels of dissolved oxygen can harm aquatic animals such as fish, amphibians and copepods. Thermal pollution may also increase the metabolic rate of aquatic animals, as enzyme activity, resulting in these organisms consuming more food in a shorter time than if their environment were not changed. An increased metabolic rate may result in food source shortages, causing a sharp decrease in a population. Changes in the environment may also result in a migration of organisms to another, more suitable environment and to in-migration of fishes that normally only live in warmer waters elsewhere. This leads to competition for fewer resources; the more adapted organisms moving in may have an advantage over organisms that are not used to the warmer temperature. As a result one has the problem of compromising food chains of the old and new environments. Biodiversity can be decreased as a result.

Construction of hydro-power stations is limited due to water resources availability and the necessity to construct on a substantial part of fertile land. One of the alternatives is nuclear energy which is a highly concentrated source of energy in comparison with fossil fuel. However, there are problems of disposing nuclear waste product which can remain hazardous for thousands of years.

1.2 Objectives of Study

The main objectives of this study are:

1. To evaluate the level of awareness of solar energy.
2. To study the potential for use of solar energy.
3. To evaluate willingness to pay for solar energy.

1.3 Scope of Study

This study is to understand the public's perception and awareness of the on solar energy. The study areas are limited to Kuala Lumpur and it covers existing and future user of solar energy

1.4 Limitation of Study

The solar photovoltaic products, supply and price range will be surveyed. The study's limitations are time and cost.

1.5 Significance of Study

Asian countries have been greatly relying on dirty-burning coal to stimulate its rapidly growing economy. The domination of coal in the energy mix in developing countries of Asia merged with rapid urbanization has led to environmental consequences. The most attractive way of encountering the increase of energy demands is to use environmental friendly, renewable energy source, primarily solar energy.

The fossil fuel era is projected to span a mere 600 years. It began around the mid-1800's which is the time of industrial revolution and trailing off sometime in the mid-2400's. However, natural gas and oil are expected to deplete earlier (Tabb, 1984). The exhaustion of non-renewable source of energy will be a crisis in the future.

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